THERMAL SURVEILLANCE OF VOLCANOES OF THE CASCADE RANGE AND ICELAND UTILIZING ERTS DCP SYSTEMS AND IMAGERY

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Type I Progress Report

ERTS A

a. Title: Thermal Surveillance of Volcanoes of the Cascade Range and Iceland Utilizing ERTS DCP Systems and Imagery

ERTS A Proposal No.: SR 251

GSFC ID No. of P.I.: IN 023

c. Problems impeding progress of investigation

Fall and winter weather at elevations above 8,000 feet in the Cascade Range (Mount Saint Helens and Mount Baker) will probably preclude installation in 1972 of the last two of five Data Collection Platform (DCP) systems. These DCP systems were received by the USGS from General Electric on September 22nd. For DCP installations completed subsequent to that date, see (d).

Short daylight hours during the early winter at 65°N and variable but extensive cloud cover will require continued, detailed monitoring of weather conditions over Iceland during orbits suitable for image acquisition.

d. Discussion of the accomplishments and those planned for the next reporting period

During the reporting period six DCP systems for experiment SR 251 were received by the USGS electronics

laboratory at the Mississippi Test Facility (MTF). Thermistor sensor arrays keyed to temperature ranges at surface thermal anomalies in the Cascade Range were interfaced with the transmitter sets at MTF in Mississippi. During the latter half of October, DCP No. 6020 was installed at 8,000 feet elevation at the Bumpass Hell thermal area in Lassen National Park, California. DCP No. 6104 was installed at 6,000 feet elevation at the Devil's Kitchen thermal area, also in Lassen National Park. Both systems utilize eight thermistor probes to obtain temperature data at geothermal ground surfaces, 50 cm depth, nongeothermal ground, thermal springs, fumaroles and air and instrument box temperatures. Several sets of data are expected to be suitable for determination of outgoing radiant flux and near-surface convective heat flow. A USGS computer program designed for reduction of the above-mentioned data will be debugged as data readout cards are received from GSFC during the next reporting period. As of November 1st all probes were reporting consistent data and both transmitters were functioning well despite possible snow over the antenna cover. Transmission was received primarily at Goldstone, California.

The installation of the Lassen systems was completed successfully by use of a Bell G-3 B1 helicopter, necessary

because of the weight of accessory installation equipment and the closure of ground access routes by snowfall.

A similar installation was attempted on October 25th at a slope thermal anomaly near the 9,677 foot summit of Mount Saint Helens. One thousand pounds of equipment, including all electronic components, construction materials, and a five-man USGS installation team were landed at the summit. During a helicopter fueling operation, a mountain storm forced the installation team to make a hazardous descent of the mountain before the actual installation of the DCP system was attempted. If weather permits, an unlikely possibility during the next few months, a second attempt will be made at Mount Saint Helens. Similarly, when U.S. Forest Service permission is finally granted for installation near the summit of Mount Baker, an installation will be attempted there when weather permits.

ERTS image interpretation for the Cascade Range and Mount Lassen will begin during the next reporting period.

e. Significant scientific results

Categories: 3. c - Volcano surveys

3. f - Geothermal surveys

It is premature to discuss scientific results from the DCP systems installed in October. No scientific results from the Iceland part of experiment 251 can be reported until (a) ERTS MSS imagery over Iceland is processed,

transmitted to the Principal Investigator and analyzed, or until (b) a DCP station is operative from Iceland.

f. A listing of published articles, etc.

None.

g. Recommendation for maximum utilization of the ERTS-A system

See (c) (d) and (e).

h. A listing of changes in Standing Order forms

None.

i. ERTS Image Descriptor forms

None.

j. Listing by date of any changed Data Request forms

None.

k. Status of DCP

Important see (d).